

MENTAL MAPS: THEORETICAL AND METHODOLOGICAL ISSUES AND CONTRIBUTIONS

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Abstract. This paper aims to perform a brief overview of the theoretical discussions and methodological issues of mental maps. Therefore, its foundations consist of psychology theories originated from studies in environmental perception and from the contributions of phenomenology, both of which encouraged the development of areas in geography such as Geography of Perception and Humanistic Geography. The difficulties, possibilities, techniques and contributions of this imaging resource will be raised and discussed with the intention to trace the multiple knowledge capability offered by this study area.

Keywords: Mental Maps, Theoretical and Methodological Issues, Geographical Science.

1. Introduction

Mental maps are not the result of international cartographic conventions; they are the unique, subjective, and selective representations of reality (SULSTERS, 2005), cognitive or mental images of an environment constructed by an individual or a group (POCOCK, 1976). This construction is an active process and the individuals are considered a conscious map builder, capable of developing their own maps with symbols, measures, and peculiar projections. Therefore, mental maps are important methodological tools for reflecting about the relationship between individuals and places. In this paper, important issues – theoretical and methodological – are raised. Firstly, the concepts of perception and image, according to theoretical currents in Psychology and Geography, are discussed, laying the foundation for further theoretical discussion about mental maps. In this last section,

the many nomenclature and definitions related to this imaging instrument are addressed, as well as its methodological possibilities, difficulties, contributions to the study of the mind, and especially, its contributions to urban research and the geographical science in general.

2. THE CONCEPT OF IMAGE AND PERCEPTION

In the 1960s, mental maps, among other mental phenomena in general, emerge from the interest developed by geographers in the context of the Humanistic Geography and the Geography of Perception (TUAN, 1975). However, the roots of the mental maps come from the connection to other sciences and can be traced to the beginning of the 20th century, as seen in the behaviorist theory, also known as environmental psychology. Due to this movement, one of the first concepts of perception is developed and, along with the concept of image, will serve as a foundation to the idea of mental maps.

Behaviorists' restrict views of perception were based on the physiological aspects of human senses, where the body answers through a stimulus-response mechanism due, mainly, to physical environment issues (SEAMON, 1980). This concept presents men as passive, as if feelings were not connected with past experiences (DUARTE, 2005).

Phenomenology is the field that starts to consider perception more comprehensively, as seen in the study of Merleau-Ponty (2006), which adapts the psychological and physiological processes to create the idea of perception grounded on senses and experiences (MERLEAU-PONTY, 2006).

The subjectivity, just as the intersubjectivity, interferes in this process, which also involves memory recollection (RICOEUR, 2007). Hence, under this perspective, perception would be intrinsically connected to the space because "perception is an act of spatialization of the beings of the world" (DUARTE, p.13, 2005); in perception, I stop being myself and become another being connected to the world (DUARTE, 2005). Since vision does not necessarily produce images and is an imagination effort created based on momentary necessities, and because its responses to stimuli are very selective, perception is not an instantaneous and mechanical registry of information (TUAN, 1975).

Image and perception are two different concepts that should not be mistaken, but that should not be seen as opposing terms either. It is possible to note the surrounding environment and reflect about it without the use of images, just as images may be produced and be unrelated to the environment stimuli; an example would be a person who projects in his or her mind the image of his or her comfortable bed, despite being in a crowded party. Regardless of what was mentioned previously, perception and image

may be associated, as in cases where environmental stimuli send related images; an example would be situations in which we feel the coldness of the freezer and connect the sensation to an image of a place with snow. In this example, the image is developed by the nervous system, in a process that involves perception, meaning that these two concepts – image and perception – should not be seen as antagonists, but as a continuum (HOLT,1972). The connection between perception and image is corroborated by the perspective of Kenneth Boulding, when image is referred to as perceived reality and constitutes the mediating link between men and the real environment. In order to comprehend the image, it is necessary to understand men's relationship with the environment, as well as men's behavior (BOULDING,1956).

When it comes to the behavior of men regarding to their environment, emotional factors, such as affectivity, will influence not only images, but also the notion of distance. Individuals tend to exacerbate the importance of places they like, such as the city where they live in and other more distant places that they enjoy, and create a perception of distance toward closer cities and neighborhoods without an affective involvement in their lives (GOULD & WHITE, 1974).

3. MENTAL MAPS: THEORY DISCUSSION

The imagery phenomenon, just as the mental maps and the images themselves, may be constructed directly or indirectly. The first form concerns the constructions that are based on personal experiences, such as trips and/or living in a certain place for years. The latter is based on information received from other people, written text, TV, radio, artwork, and posters that evoke a specific place (GOULD & WHITE, 1974).

Before the idea of mental maps became a tool for the geography field, it was developed in the study of psychology (just as the concept of perception) and was connected to the concept that rats, and probably men also, offered responses based on successive and specific stimuli from the physical environment. Therefore, the mental map would be created based on these stimuli, which would result in complete environmental fields reflected in an image connecting the fields of performance, action, and behavior of the being (TOLMAN, 1948).

As an image-based typology, the mental map works also as a filter between behavior and the real environment and is considered, in the field of geography, as cartographic representations of individuals' evaluations or preferences for places, or even simple schemes of streets, countries, and continents (GOULD, 1967; SAARINEN,1976). Perception relates to mental maps

because they are seen as “products of perceived image, of the perception registered by the subject” (LIMA & KOZEL, 2009,p.211).

The construction of mental maps happens through drawings created based on sensible observations, on experiences related to the place, and are not, therefore, founded on strict and precise information (LIMA & KOZEL, 2009). The contributions of the phenomenology, also known as the “science of experience” (ENTRIKIN, 1980, p.9), conform to the viewpoint of mental maps because phenomenology is inserted in the theory of Humanistic Geography, which considers the imagery phenomenon as unique visions of a spatial reality, reflecting experiences and affections occurred between the individual and its part of the space.

Although there are unique elements in the mental maps of each individual, it is possible to see shared elements, characterizing the view of specific groups, such as gender, age, or the years living in the area, or of groups of people with access to privileged information. Regarding the difference in the perception of groups of different ages, it is important to emphasize that, in general, children up to five years old are not capable to create a mental plan or to become aware of it (PIAGET,1977), complicating the conduction of image studies with this age group.

When comparing local residents (insiders) with non-locals (outsiders), it is possible to note distinguished views; however, when analyzing each group internally, similar viewpoints are noticeable. Understanding group views helps understanding how these groups make decisions, act under certain circumstances, or, in summary, what their daily routine looks like in a certain space (ALVAREZ, 1981).

Also, among the possible applications of mental maps, we can note: Its use as reference for issues of orientation and movement along the territory (tracing routes), and its use in the process of evaluation and determination of preferences, as in urban planning (SULSTERS, 2005). It is important to note that tracing routes for orientation does not need to be done on paper. The gestures and the process of mental construction of a map when giving directions already qualify as mental map, according to TUAN (1975), because the image is constructed through the mind's spatial behavior before it is put on paper. The maps constructed inside the brain are also called cognitive maps (SEEMAN, 2003). The spatiality inherent to mental maps may be used for objects and phenomenon in general, and the mnemonic function may be attributed to this imagery resource in order to attend to the necessity of decorating events, objects, and individuals related either specifically or arbitrarily to the spaces (TUAN, 1975).

With regards to the study of perception and its relation to mental maps, there are two knowledge areas. The first relates to cognitive fields of study, concerned about deciphering the enigmas of the human mind. In fields

with focus on the mind, such as psychology, mental maps are used with the intent to better understand how the brain constructs images. On the other hand, the second area focuses on aspects of the environment, such as its shape, dimension, scale, and the experiences lived in it. Therefore, this area studies the relationship of individuals with their own geographical space, their experiences, their way of living, "their practices and socio-cultural relationships with people and place" (DE PAULA, 2010, p.6). This last approach is the one closest to the geographical field and Kevin Lynch (1960) was one of the first scholars to contribute to the use of mental maps as a method to understand the urban image.

In his book, "The image of the city", LYNCH (1960) tries to reach the legibility of the city based on mental mapping from its residents. The image constructed in the minds of the residents is a product of the senses, the perception, and the memory of the individual, as well as of the symbology developed for the construction of the mental map. This allows the city to be read and comprehended as a structural base composed by intelligible symbols. According to TUAN (1980), the human behavior and existence present symbols, an extensive theme for Geography, which searches for these means of expression by subjects, especially those referring to space in a material or immaterial way. Therefore, the symbol may be seen as a fragment with the objective to apprehend a totality.

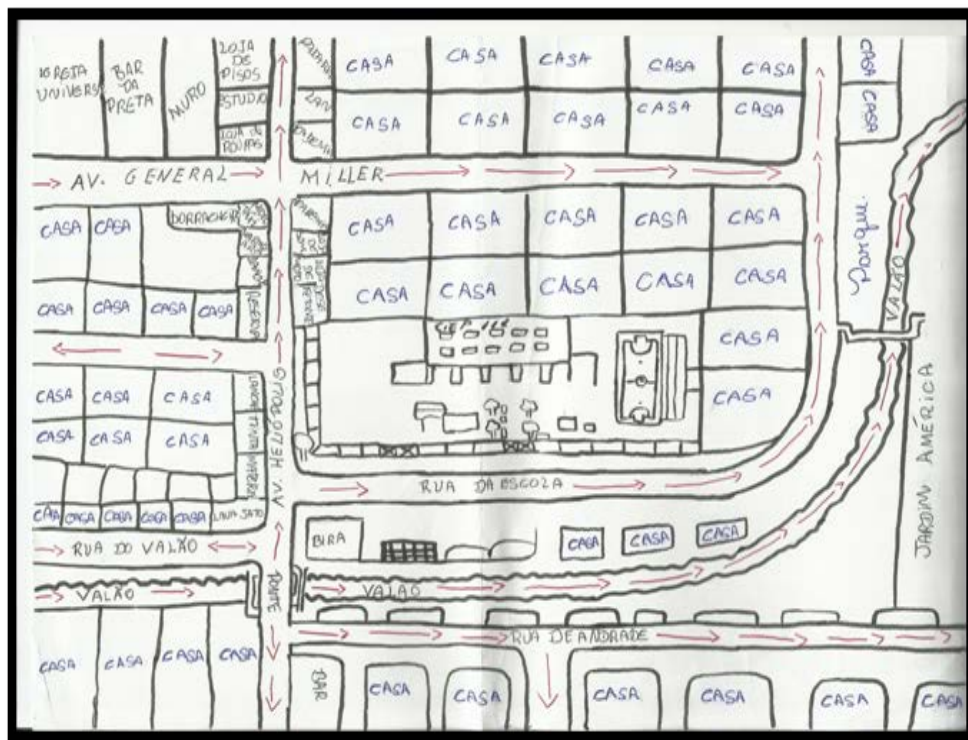
In order to understand the images produced during the study, LYNCH (1960) also used questionnaires composed by questions that could facilitate the comprehension of the maps, and possibly offer complementary information. These methodological resources were analyzed through the observation of most frequent elements, as well as the expressivity presented in the maps, to aid the urban planning of the city in the study and provide a better quality of life to its residents. According to DEL RIO (1996), the importance of mental maps lies in the opportunity to list familiar places in the constructed environment, impregnated with meaningful memories that require a mental and social stability.

The studies of LYNCH (1960) corroborate the idea that mental maps are richer in details when closer to individuals' intimate spaces. According to PINHEIRO (2005), experiences are the support for the way we represent the environment. Those places where the individual spends more time, such as their home and their neighborhood, are represented differently from the city or the country, because the bigger the spatial area, the bigger the role of secondary or indirect information.

4. MENTAL MAPS: METHODOLOGICAL ISSUES AND CONTRIBUTIONS

A mental map is not available intact and ready in someone's mind. Generally, interviewees are only challenged to recollect images previously conceived when the exercise is proposed. Therefore, a nomenclature that would avoid critiques to the term mental map would be latent or potential map (POCOCK, 1976).

Mental maps may be obtained indirectly or directly. Maps obtained indirectly are based on verbal registries that are later processed to take the shape of a map with the construction of isolines, lines with the same level of perception (GOULD & WHITE, 1974), or the construction of distance maps (LEE, 1970). Maps obtained directly are created by the interviewee from a base map with the limits of the place to be studied, or even through a drawing (picture 1), called free-recording draft map (POCOCK, 1976).



Picture 1. Mental map developed by a student from the Ciep 199, a Rio de Janeiro state public school. Source: author's collection.

Mental maps arising from interviewees' drawings present an initial simplicity that may be positive, but, at the same time, negative. The importance of this method is to understand the mental organization of the environment surrounding the individual who creates the map. Although this technique diminishes the influence of the researcher, there is still a certain level of influence, which will show in the more emphasized aspects of the mapping process. The dimensions and shape of the paper will also influence the results (POCOCK, 1972). In addition, the map will be easier or harder to read depending on the ability of the interviewees to draw their mental image on a paper sheet. The complexity of the place to be mapped and its extension are two other variables that will affect the result of the mental mapping. Finally, as previously mentioned, it is easier to map a neighborhood than a city (POCOCK, 1976).

Among the difficulties regarding data analysis seen in the study of mental maps are those concerning the systematization of information, especially when trying to quantify the data (DE PAULA, 2010). Qualitative methods based on the comparison of maps, which searches for common characteristics within groups in order to identify similar points of view, are other methodological instruments. It is important that mental maps are used in conjunction with other data collection instruments such as interviews and questionnaires to diminish the previously discussed difficulties associated with the techniques to create mental maps. Unspoken comments, gestures, and silences should be seen by the researcher as texts to be read and interpreted, and used to complement, add, and deepen the information exposed in the mental maps.

It is necessary that discussions about mental maps become more common in Brazil because the theoretical and methodological literature is scarce, causing, most of the times, the use of methodologies developed by foreign scholars, such as the one proposed by Kevin Lynch (1982), in the book "The image of the city". Internationally, mental maps' studies should be used more often in areas of Humanistic and Cultural Geography, and continue to be used in studies about environmental perception, as highlighted by CASTELLO (2000).

There are multiple possibilities for mental maps. They help answer general Geography questions, for example: "How are spaces constructed? What are the relationships human-beings establish with spaces?" (LIMA & KOZEL, 2009, p. 211). Questions related to orientation, knowing how people conduct themselves and how they find their way in the space is another important question (SULSTERS, 2005).

There are specific questions regarding urban studies as well, such as: What are the urban elements and artifacts that are performing an important job? What are some of the marks? What activities are happening in the public

area and how does the physical environment support these? What artifacts or parts of a public area are more utilized and by what groups? What are the places considered typical of the area? Where the psychological borders inside the projected area and what are the names or qualifications given to these areas? It is important to remember that, in this type of study, the level of conclusions and assumptions depends on how meaningful individuals consider urban aspects to be (SUSLTERS, 2005).

Questions regarding the discovery of the internal mechanisms of the mind may also be asked, according to TUAN (1975). They are: How can we recognize places and find ways between them? Are our movements guided by images in our minds? What is the relationship between perception and imaginative faculty that allows us to go to places without having a direct experience with these portions of the space? How is it possible to give directions to another person? How can the geography of places unknown to the student be taught?

The gamut of previous questions justify the importance and amplitude of the study of mental maps, which need to be approached through conversations between various sciences, such as Psychology, Anthropology, Sociology, and Geography (OLIVEIRA, 2006).

5. Conclusion

The map is not about reality; it relates to the discovery, the opinion, and the vision of the individuals that develop it. It is through the process named cartographic generalization that the complex reality is selected and simplified, and that the valorization of certain aspects over others happen based on the importance attributed by the map developer, who chooses what seems essential in that spatial portion (WOOD, 1992). Hence, the conventional map, such as the mental map, will always reflect the vision of an individual or group. However, mental maps allow more freedom for the inclusion of subjective and intersubjective issues, making it more detailed on its spatial representation.

As mentioned before, there should be a conversation between different fields of study in order to have an in-depth reflection about mental maps. In order to aid and deepen the current knowledge about this imagery resource, when used as a methodological instrument, mental maps should be accompanied by other data collection instruments.

In the matter of urban issues, the mental mapping may be an instrument used for urban development because it helps define urban planning proposals. This resource is capable of showing the perception of existing identities in a city or neighborhood, for example, while also presenting the expression of values of the urban landscape. Based on this information, it is

possible to develop strategies that provide a better suitability among spatial form, utilization, and symbols, and the recognition and valorization of this same space by different groups of people (SULSTERS, 2005).

Although mental maps have potential, as illustrated by its use as a methodological instrument to study the relationship between individuals and places, they should not be applied blindly. In fact, the application of mental maps should be based on a theoretical and critical study with the objective to adapt the instrument to the lines of thought befitting the objectives of the study, and to choose the most appropriate techniques and analysis/interpretation formats – qualitative and/or quantitative.

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